

**REMARKS**

Initially, applicants acknowledge with appreciation the courteous and helpful personal interview extended to their undersigned representative by the Examiner, Mr. Higgins, and his supervisor, SPE Mark Ruthkosky, on June 15, 2011. The substance of the interview is believed to be included in the following remarks.

For convenience in responding to the Office Action, the various parts of the Action are identified below using the headings used in the Action.

***Claim Objections***

Claims 3, 5, 6, 8, and 11-13 have been amended to avoid the objection to the claims by changing the recitation "A layered product" to --The layered product-- as proposed in the Action.

Claims 17, 19, and 20 have been amended to avoid the objection to the claims by changing the recitation "An integrated molded object" to --The integrated molded object-- as proposed in the Action.

Removal of the objection to the claims is requested.

***Claim Rejections - 35 USC § 112***

Claim 39 has been amended to avoid the 35 U.S.C. § 112, first paragraph, rejection by changing the recitation "(g) a distance between the maximum innermost filament in said filaments in the

resin of said thermoplastic resin layer in the thickness direction thereof and the minimum innermost filament is 10  $\mu\text{m}$  or more" to --  
(g) a distance between the maximum innermost filament in said filaments in the resin of said thermoplastic resin layer in the thickness direction thereof and an outermost filament is 10  $\mu\text{m}$  or more-- as kindly proposed by the Office to overcome the 35 U.S.C. § 112, first paragraph, rejection.

A new claim, claim 40, has been added to the application. New claim 40, depends on claim 39, and includes the additional limitation --(h) the distance between the maximum innermost filament in said filaments in the resin of said thermoplastic resin layer in the thickness direction thereof and the minimum innermost filament is 10 to 30  $\mu\text{m}$ --. This limitation corresponds to the second proposal in the Action for overcoming the 35 U.S.C. § 112, first paragraph, rejection.

Removal of the 35 U.S.C. § 112, first paragraph, rejection is requested.

***Claim Rejections - 35 USC § 102***

Claims 1, 3, 5, 6, 8, 11-13 and 39 are rejected under 35 USC § 102(b) as being anticipated by Obara (JP 07-047152) "as evidenced by applicants' own admissions." (Action, page 4, last line). The Office explains that [the mold produced] in Comparative Example 2

of Obara results in the formation of a clear interface between the thermosetting layer and the thermoplastic layer. The Office notes that pictures T4 and T5 of the declaration under 37 C.F.R. § 1.132 filed October 22, 2010, are pictures of this clear interface. The Office states:

"Judging by these pictures, the clear interface would read on applicants' continuous rugged interface; furthermore, judging by the scale in T5 it is inherent to this device that the distance between the outermost reinforcing continuous filament and the innermost reinforcing continuous filament will be 10 microns or more as claimed."

(Emphasis applicants').

Applicants' independent claim 1 as amended in the Submission under 37 C.F.R. § 1.114 filed in this application requires that the "continuous rugged interface [have] a structure such that **some of said reinforcing continuous filaments** [the reinforcing continuous filaments arranged in one direction in said layered product and existing in both the thermosetting resin layer and the thermoplastic resin layer as recited in claim 1] parallel to the first and second opposed surfaces of the layered product extend through said continuous rugged interface and **exist in the resin of**

***said thermoplastic resin layer and also exist in the resin of said thermosetting resin layer.*** (Emphasis added). Applicants' independent claim 39 as amended in the Submission requires that "***a portion of said filaments*** [the reinforcing continuous filaments arranged in one direction in said layered product as recited in claim 39] ***are included in both of said thermosetting resin layer and said thermoplastic resin layer through said continuous rugged interface.***" (Emphasis added).

The Office does not explain its conclusion that "the clear interface would read on applicants' continuous rugged interface". More particularly, the Office does not explain how the clear interface of the mold of Comparative Example 2 of Obara meets the above-quoted structural limitations of claims 1 and 39. As explained by the undersigned during the interview, applicants, who are persons of at least ordinary skill in the art, believed from the Action that interface of the mold of Comparative Example 2 of Obara was not clear in pictures T4 and T5 of the declaration under 37 C.F.R. § 1.132 filed October 22, 2010.

Applicants, therefore, as explained during the interview, prepared a further declaration under 37 C.F.R. § 1.132 which is intended to show that the product of the comparative example of Obara does not meet the limitations of claim 1 or of claim 39 as

amended in the Submission. The new 132 declaration includes a new picture, Figure T6, that has been prepared by adjusting the contrast in Figure T4 of the first declaration under 37 C.F.R. § 1.132 of Mr. Honma.

The new 132 declaration was shown to the Examiners during the personal interview of June 15, 2011. This declaration, "SECOND DECLARATION UNDER 37 C.F.R. § 1.132", is being submitted to the Office concurrently with this response in the form of an Exhibit under 37 C.F.R. § 1.91(a)(1) so that the original pictures which are part of the declaration (and not scanned or electronic copies) can be viewed by the Office.

During the interview, Mr. Higgins indicated that the new declaration does not overcome the 35 U.S.C. § 102 rejection because the fibers at the interface in the photographs read on the claims. Specifically, he stated that individual fibers at the interface which are shown to be partly in the thermosetting resin layer and partly in the thermoplastic resin layer "exist in the resin of said thermoplastic resin layer and also exist in the resin of said thermosetting resin layer."

In light of the position taken by Mr. Higgins during the interview, claim 1 has been amended herein to define that "portions of said filaments extending through said continuous rugged

interface exist exclusively in their longitudinal direction in the resin of said thermoplastic resin layer and ~~also~~ other portions of the same filaments extending through said continuous rugged interface exist exclusively in their longitudinal direction in the resin of said thermosetting resin layer." Similar amendments have been made to claims 17 and 39. The amendments to claims 1, 17 and 39 are supported by the description in the specification of the present application in the paragraph beginning in line 7 on page 20 (paragraph [0080] of US 2006/0110599 A1, the publication of the application), particularly when read in light of the four corners of the specification and the drawings. This paragraph reads:

"This problem can be solved by the layered product A1 of the invention. The layered product A1 has a feature that it is a molded object in which the resin of a thermosetting resin layer and the resin of a thermoplastic resin layer are integrated while forming ruggedness at their interface, and in which a set of filaments among groups of reinforcing fibers is kept in contact with at least the resin of the thermosetting resin layer while the other set of filaments among the groups of reinforcing fibers is kept in contact with at least the resin of the thermoplastic resin layer. This

feature also includes a case where some filaments among the groups of reinforcing fibers are kept in contact with the resin of the thermosetting resin partially in their longitudinal direction and also are kept in contact with the resin of the thermoplastic resin layer in the other portions of them. This feature cannot be seen in the conventional layered product."

(Emphasis applicants').

Applicants note that a new claim, claim 41, which corresponds to claim 1 and includes the further limitation that "more than one filament is included in the rugged interface in the thickness direction of the layered product", has been added to the application. This further limitation is supported in the present application in Fig. 3 and the description of Fig. 3 in the specification of the application on page 21, line 20, to page 22, line 3, i.e.:

"An observation result of the layered product A1 of the invention is shown in Fig. 3. Fig. 3 shows a state where the resin of the thermoplastic resin layer 22 goes into the clearances among the numerous filaments 23a and 23b constituting the groups of reinforcing fibers 23, and further a state where the interface 24 between the

thermosetting resin layer 21 and the thermoplastic resin layer 22 is rugged. The existence of the rugged interface 24 including numerous filaments assures the strong bonding between the thermoplastic [should be "thermosetting"] resin layer 21 and the thermoplastic resin layer 22."

(Emphasis applicants').

Applicants respectfully submit that the clear interface of the mold of Comparative Example 2 of Obara in the photographs in the declarations under 37 C.F.R. § 1.132 does not read on the amended claims. In particular, Figure T6 of the second declaration shows that in the clear interface of the mold produced in Comparative Example 2 of Obara the thermosetting resin layer is not intermingled with the thermoplastic resin layer in a rugged manner to form a rugged interface wherein "portions of said filaments extending through said continuous rugged interface exist exclusively in their longitudinal direction in the resin of said thermoplastic resin layer and other portions of the same filaments extending through said continuous rugged interface exist exclusively in their longitudinal direction in the resin of said thermosetting resin layer.

The showing of the second 132 declaration rebuts the



conclusion of the Office that Obara anticipates claims 1 and 39, and the claims dependent thereon, of the present application. Withdrawal of the 35 USC § 102(b) rejection of claims 1, 3, 5, 6, 8, 11-13 and 39 under 35 USC § 102(b) as being anticipated by Obara is in order.

***Claim Rejections - 35 USC § 102/103***

The Office has maintained the rejection of claims 1, 3, 5, 6, 8, 11-13, 16, 17, 19, 20 and 39 under 35 USC § 102(b) as anticipated by or, in the alternative, under 35 USC § 103(a) as obvious over Evans et al., US 4,604,319 ("Evans") that was made in the Final Office Action dated March 25, 2010.

In the present Action, the Office describes Evans as disclosing a composite **24** as shown in Fig. 3 which is comprised of a fiber resin matrix **18** comprising a thermosetting resin and reinforcing filaments **2**, and which is identified by the Office as reading on applicants' thermosetting resin layer and reinforcing continuous filaments arranged in one direction, and is also comprised of a layer of interleaf material **22** comprised essentially of a thermoplastic resin, and which is identified by the Office as reading on applicants' thermoplastic resin layer. The Office notes that the composite is made by first forming a prepreg of the filaments in the thermosetting resin, then placing a layer of the

thermoplastic resin onto the prepreg, and then curing the composite, "for example, at 350 °F and 100 psi, wherein 100 psi is approximately 0.7 MPa ... ." (Action, page 7, lines 3-4 from the bottom of the page).

The Office then concludes:

"Given the fact that the Examiner has provided a layered composite identical to that claimed, which has been prepared at a pressure that is analogous to applicants' preferred pressure (page 9, lines 7-11) and using thermoplastic and thermosetting resins that are among applicants' preferred resin (page 8, line 14-22), the Examiner deems that the composite of Evans et al. will inherently possess the continuous rugged interface region claimed, including a portion of filaments that exist in both the thermosetting and thermoplastic resin layers."

(Action, page 7, line 2 from the bottom of the page, to page 8, line 5). (Emphasis applicants').

With respect to the limitation in claim 1 that "the thickness of an area in said thermoplastic resin layer between an outermost reinforcing continuous filament with respect to the second opposed surface and an innermost reinforcing continuous filament with respect to the second opposed surface is 10  $\mu$ m or more," the Office

states that the thermoplastic interleaf layer of Evans may be as thick as 50  $\mu$ m and then concludes:

"Also using the same rationale as provided above concerning the "continuous rugged interface," the Examiner deems that the composite of Evans et al. having a thermoplastic interleaf layer of 50  $\mu$ m will inherently possess the reinforcing filaments 2 in at least a 10  $\mu$ m thickness region as claimed."

(Action, page 8, lines 12-15).

Applicants respectfully submit that, for the reasons explained below, the gist of which was explained by the undersigned during the interview on June 15, 2011, the 35 USC § 102(b) or, alternative, 35 USC § 103(a) rejection of claims 1, 3, 5, 6, 8, 11-13, 16, 17, 19, 20 and 39 over Evans is not proper as it applies to the claims of the present application as amended in the Submission under 37 C.F.R. § 1.114 filed October 22, 2010, and to the extent that it is considered to apply to the claims as amended herein.

First, the Office has not satisfied its burden of showing a *prima facie* case of inherent anticipation under 35 USC § 102.

As explained in the Submission under 37 C.F.R. § 1.114 filed October 22, 2010, anticipation of a claim under 35 U.S.C. § 102 requires the disclosure in a single prior art reference of every

limitation of the claimed invention, either explicitly or inherently. The claim limitation or limitations must necessarily be included in the prior art reference in order for the reference to anticipate. Inherency may not be established by possibilities or probabilities. The fact that a limitation may result from the disclosure of a reference is not sufficient. *In re Oelrich*, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981) and *In re King*, 801 F.2d 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1986). Moreover, as stated by the court in *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 220 USPQ 303, 314 (Fed. Cir. 1983): "[a]nticipation of inventions set forth in product claims cannot be predicated on mere conjecture respecting the characteristics of products that might result from the practice of processes disclosed in references. (citing *In re Felton*, [484 F.2d 495] 484 F.2d 495, 500, 179 USPQ 295, 298 (CCPA 1973)). (Emphasis applicants').

The layered product of the present invention is produced by a process which requires that the thermoplastic resin layer be molten, or sufficiently softened, at or lower than the temperature at which the thermosetting resin is set so that the thermoplastic resin permeates, or impregnates, the groups of reinforcing fibers of a prepreg comprised of the reinforcing fibers and the thermosetting resin. For example, the specification of the present

application describes:

"The process for producing a layered product of the invention comprises the step of disposing a base material for thermal bonding composed of a thermoplastic resin, on a surface of a prepreg obtained by impregnating groups of reinforcing fibers consisting of numerous continuous filaments with a thermosetting resin not yet set, and impregnating the groups of reinforcing fibers with the thermoplastic resin of the base material for thermal bonding, during the setting reaction of the thermosetting resin or during preheating before the setting reaction."

(Paragraph [0030] of US 2006/0110599 A1, the publication of the present application).

"As a particular example of the integration method (ii), the structural member B1 or B2 is produced by injection molding, processed or post-treated to achieve a predetermined size as required, and inserted into a press mold, and subsequently the press mold is heated to a process temperature. Then, a base material in which a thermoplastic resin layer is formed on the surface of a prepreg destined to be the layered product A1 or A2, composed of a thermosetting resin not yet set and groups

of conductive fibers consisting of numerous continuous filaments, is laid up, and vacuum bag molding is carried out at a temperature higher than the melting point of the thermoplastic resin."

(Paragraph [0127] of US 2006/0110599 A1).

"The layered product A is produced as described below. A prepreg 60 in which reinforcing fiber bundles 63 consisting of numerous continuous filaments are impregnated with a thermosetting resin 61 as the matrix resin is cut into a predetermined size (step 71). Sheets of the prepreg 60 are laminated at predetermined angles, for example, five sheets are laminated at angles of 0 degree, +45 degrees, 90 degrees, -45 degrees and 0 degree, and a base material 62 for thermal bonding composed of a thermoplastic resin composition is disposed to cover the whole portion or partial portion of the surface, as lamination step 72. Subsequently the thermoplastic resin composition of the base material 62 for thermal bonding is molten and pressurized concurrently with the setting reaction of the thermosetting resin composition or by preheating before the setting reaction, to mold a thermoplastic resin layer

and a thermoplastic resin film, as heat molding step 73 (layered product molding subprocess 70). That is, after the thermoplastic resin composition 62 is disposed as a film on the surface layer of the prepreg 60 consisting of the thermosetting resin composition not yet set and the reinforcing fiber bundles, the thermosetting resin composition is set at a temperature higher than the melting point of the thermoplastic resin composition 62. Thus, the layered product A in which the thermosetting resin composition 61 and the thermoplastic resin composition 62 are well bonded to each other with the reinforcing fiber bundles 63 existing among them can be obtained. The reason why the adhesive strength is high is that the thermoplastic resin composition in a state of being molten permeates through the numerous filaments constituting the reinforcing fiber bundles against the thermosetting resin composition in a state of being set, to form a rugged interface between the thermosetting resin composition and the thermoplastic resin composition with numerous filaments existing among them."

(Paragraph [0139] of US 2006/0110599 A1). (Emphasis added).

Then, a male mold member (not shown in the drawing) was

installed for carrying out press molding. A press molding machine was used for preheating at 160 °C for 5 minutes, to melt the base material 171 for thermal bonding, and with a pressure of 6 MPa applied, the laminate was heated at 150 °C for 30 minutes, to set the thermosetting resin. After completion of setting, the laminate was cooled at room temperature and removed from the mold, to produce a layered product A4 with an average thickness of 0.7 mm."

(Example 1-1, paragraph [0206] of US 2006/0110599 A1). In Example 1-1, a ternary copolyamide resin having a melting point of 150 °C is used as the base material 171 (see Example 3-1).

It is clear from these descriptions that the temperature and pressure and time of heating required to obtain the layered product of the present invention having a continuous rugged interface as defined in the claims of the present application are dependent upon the specific thermoplastic resin and thermosetting resin, and the properties thereof, and the conditions used to make the layered product of the invention.

Nothing in Evans directs the person of ordinary skill in the art to the choice of specific thermoplastic resins, thermosetting resins, temperatures, pressures and time that will **necessarily** produce a layered product having a continuous rugged interface as



defined in the claims.

To the contrary, the teachings of Evans support a conclusion that a continuous rugged interface as required in the claims of the present application is not formed.

First, at column 3, lines 46-54, Evans describes:

"On a microscopic level, there may be an extremely thin layer 30 at the matrix resin/interleaf resin interface, characteristic of adhesive-type bonding, where the thermoplastic interleaf material dissolves slightly in the matrix resin; however, aside from this bonding interface, the interleaf material must be capable of maintaining a discrete interleaf layer, and no general intermixing of the interleaf layer and resin matrix layer occurs (Fig. 4)."

(Emphasis applicants').

Second, at column 7, lines 48-57, Evans describes:

"The thermoplastic resin of the interleaf comprises a high molecular weight engineering thermoplastic, much [sic] as a polyester, a polyamide, a polyaramid, a polyarylate, a polycarbonate, a poly(ester carbonate), a polybenzimidazole, a polyimide, a polyether imide, a polyamide imide, and the like. Preferably the

thermoplastic will be a polyether ketone, abbreviated PEEK, a polyimide, e.g. KAPTON, or a polyether imide, e.g. ULTEM."

Polyesters, polyamides, polyaramids, polyarylates, polybenzimidazoles, polyimides, polyether imides and polyamide imides generally have melting points of greater than about 176 °C. Polycarbonates are amorphous polymers and the glass transition temperature is 150 °C. Poly(ester carbonates) are copolymerized polymers and it is difficult to determine the melting point or glass transition temperature. With regard to the preferred thermoplastics described in column 7, lines 53-57, PEEK has a melting point of 340 °C. KAPTON has no melting point and is carbonized at a higher temperature. ULTEM has no melting point and has a glass transition temperature of 217 °C.

It is clear from these descriptions in Evans, in which a processing temperature to produce a composite is usually about 180 °C and the thermoplastic resins have a melting point of more than 200 °C or have no melting point, that the thermoplastic resin does not penetrate into the thermosetting resin layer and reinforcing continuous filaments 2 existing in a thermosetting resin layer 10 (or a fiber resin matrix layer 18) are not taken into an interleaf thermoplastic resin layer 22. Consequently, a continuous rugged

interface as required by the claims of the present application is not formed.

In Example 1 of Evans, polyether polyimide (trade name: ULTEM) as the thermoplastic resin of was cast out of solvent and positioned on the prepreg. In that step, the thermoplastic resin does not penetrate into the filaments. The layered product was cured at a temperature of 350 °F (about 176 °C). ULTEM is an amorphous resin, and therefore it is necessary to heat at a temperature of or higher than the glass-transition temperature (T<sub>g</sub>) to melt the resin. The T<sub>g</sub> of the ULTEM is generally about 217 °C. Therefore, the ULTEM does not melt at the above curing temperature. As a result, it is impossible for the ULTEM to impregnate the filaments and form a continuous rugged interface. In the other examples of Evans, necessary conditions for impregnating filaments with a thermoplastic resin are also not disclosed or suggested, and as described in Evans, no general intermixing of the interleaf and resin matrix layer occurs (Col. 3, lines 53-54).

Also, it is noted that in the composite shown in Fig. 3 of Evans, cited by the Office as being identical to the layered product claimed in the present application, the thermoplastic resin remains as a discrete interleaf layer without filaments therein.

The Office states in the Action that Evans teaches the same

preferential materials as in the present invention. This assertion is, at best, overly broad. There is nothing in Evans to suggest that the same thermoplastic resins useful in the present invention are necessarily useful in the invention of Evans. Evans does not disclose that all possible polyester resins, polyamide resins, and the like can be used in its invention and the present application does not describe that all possible polyamide-based resins, polyester-based resins, and the like are useful in the layered product of the present invention. In light of the teachings of Evans described above, it is clear that it would be mere happenstance if any product made according to Evans met the limitation in the claims. However, an unwitting duplication of an invention does not constitute anticipation.

In the "Response to Arguments" section in the present Action, the Office notes that polyester, polyamide (e.g., Nylon 6), and polycarbonate have glass transition temperatures of 69, 50 and 150 °C, respectively. The Office then states: "**if** the process at col. 9, lines 27-28 of Evans et al. [Example 1] is used, i.e. 180 °C that would be above the glass transition temperatures of the resins mentioned above, hence; the resins would be softened and flowable" (Action, page 14, lines 13-14, emphasis applicants').

This conclusion is not correct. There are many kinds of

polyesters and polyamides. Therefore, it is necessary to specify a polymer structure to determine the glass transition temperature thereof. The polyester referred to by the Office is apparently polyethylene terephthalate (PET) which has a glass transition temperature ( $T_g$ ) of 70 °C. The polyamide (e.g. Nylon 6) referred to by the Office has a glass transition temperature ( $T_g$ ) of 47 °C.

Polycarbonate is an amorphous polymer and has a glass transition temperature of about 150 degrees °C. Poly(ester carbonate) is a copolymerized polymer and it is difficult to determine its melting polymer or glass transition temperature. However, PPC has a glass transition temperature of  $150+\alpha$  °C (i.e., 150 °C or so).

However, glass transition temperature is not an index of flowability of a polymer; it is a physical chemistry quantity caused by molecular motion. It is not correct that movement of resin starts where the temperature is at the glass transition temperature. A crystalline polymer does not flow up to melting of the crystal. Therefore, the crystalline polymer does not impregnate into filaments existing in a thermosetting resin layer at temperature lower than the melting point of the crystalline polymer. Furthermore, a crystalline polymer does not flow in a lower viscosity thereof. However, the viscosity of the crystalline

polymer is suddenly reduced at and higher than the melting point. Therefore, the melting point can be used as a standard without considering the viscosity.

On the other hand, in case of an amorphous polymer, it is necessary to reduce the viscosity at which the whole of the polymer can flow even though the temperature is higher than the glass transition temperature. For example, polycarbonate polymer has the glass transition temperature of 150 °C, but initial flowing begins at about 220 °C, and this flowing is needed to impregnate the polymer into filaments existing in a thermosetting resin layer.

All of the thermoplastic resins used in the examples in the specification of the present application are crystalline polymers. Accordingly it is necessary to heat the thermoplastic resins at a temperature above their melting point before the thermosetting resin is cured or set. As a result it is possible to impregnate the thermoplastic resin into filaments located in a layer of the thermosetting resin.

Nothing in Evans would lead a person of ordinary skill in the art to conclude that use of the resins having the glass transition temperatures noted in the Action under the conditions described in Example 1 would necessarily result in a product which meets all of the limitations of the layered product recited in the claims of the

present application.

Therefore, contrary to the assertion of the Office, there is insufficient evidence supporting a *prima facie* case of inherency under 35 USC § 102.

The Office has not satisfied its burden of supporting a case of *prima facie* inherency and removal of the 35 USC § 102 rejection of the claims over Evans is in order.

Regarding obviousness under 35 USC § 103(a), in response to the position of the Office in the Final Action that variation of the temperature and conditions under which the composite of Evans was made to allow the reinforcing filaments 2 of the fiber resin matrix 18 to penetrate into the thermoplastic interleaf material 22 to any depth is mere experimental optimization, applicants argued that optimization to support obviousness requires that a variable be recognized as a result-effective variable in the prior art and nothing in Evans, considered as a whole, establishes that pressure and temperature are result-effective variables to allow the reinforcing filaments of the fiber resin matrix to penetrate into the thermoplastic interleaf material.

In response to this argument, the Office, in the present Action states:

"The Examiner notes that the rejection set forth above

suggest [sic] that the temperature and pressure conditions should be optimized to allow the fibers to penetrate to any depth including 10 microns or more as claimed."

This statement is improper on its face. The Examiner's rejection cannot support an allegation of optimization. The prior art, e.g., Evans, must teach that temperature and pressure are result-effective variables to allow the thermoplastic resin to impregnate the fibers and thermosetting resin. But as explained above, nothing in Evans teaches or otherwise suggests that the interleaf layer would penetrate the thermosetting resin and reinforcing fibers therein. Nothing in Evans shows, therefore, that temperature and pressure are recognized as result-effective variables, i.e., variables which achieve the result necessary to obtain the layered product of the present invention. Therefore, the determination of the necessary optimum or workable ranges of said variables cannot be characterized as routine experimentation.

Evans, in fact, in view of the descriptions therein as explained above, leads away from a conclusion that temperature and conditions under which the composite are made can be varied to any amount in order to allow the reinforcing filaments of the fiber resin matrix to penetrate into the thermoplastic interleaf



material. As noted above, Evans, in column 3, lines 46-54, describes:

"On a microscopic level, there may be an extremely thin layer 30 at the matrix resin/interleaf resin interface, characteristic of adhesive-type bonding, where the thermoplastic interleaf material dissolves slightly in the matrix resin; however, aside from this bonding interface, the interleaf material must be capable of maintaining a discrete interleaf layer, and no general intermixing of the interleaf layer and resin matrix layer occurs (Fig. 4)."

Therefore, Evans does not properly support a case of *prima facie* obviousness under 35 U.S.C. § 103(a) of the layered product and molded object of the present invention as defined in the claims and removal of the 35 USC § 103(a) rejection is also in order.

A Notice of Allowability of the claims of the present application is respectfully requested.

The foregoing is believed to be a complete and proper response to the Office Action dated December 22, 2010, and is believed to place this application in condition for allowance.

In the event that this paper is not considered to be timely filed, applicants hereby petition for an appropriate extension of

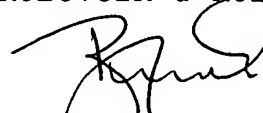
PATENT APPLN. NO. 10/540,624  
RESPONSE UNDER 37 C.F.R. §1.111

**PATENT  
NON-FINAL**

time. The fee for any such extension may be charged to our Deposit Account No. 111833.

In the event any additional fees are required, please also charge our Deposit Account No. 111833.

Respectfully submitted,  
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